

IN THE DRAWINGS

Please amend the drawings as shown in the replacement sheet for Fig. 8 attached hereto. The replacement sheet for Fig. 8 shows yoke 45 connecting the two arms 43 and 44 as described on page 6, first full paragraph of the Specification as originally filed. Accordingly, the replacement sheet for Fig. 8 does not add any new matter into the application.

REMARKS

Reconsideration of the above-identified patent application, as amended herein, is respectfully requested.

By means of the present Amendment, the limitations of claim 3 have been incorporated into claims 1 and 2, while claim 3 has been cancelled. Accordingly, claims 1-2 and 4-5 are pending in the application. Of these, claims 1 and 2 are independent.

In the Office Action dated April 27, 2005, the Examiner objected to the drawings because the yoke (45) recited in claim 2 is not shown in the drawings. By means of the present Amendment, a replacement sheet for Fig. 8 is appended hereto showing yoke (45). Accordingly, withdrawal of this objection is respectfully requested.

In the Office Action dated April 27, 2005, the Examiner objected to claim 2 because of a misspelling therein. By means of the present Amendment, this misspelling has been corrected. Also, the "drive direction" has been changed to "driving device." Accordingly, withdrawal of this ground for rejection is respectfully requested.

In the Office Action dated April 27, 2005, the Examiner objected to claim 5 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. By means of this Amendment, claim 5 has been clarified so as to satisfy the requirements of 35 U.S.C. 112, second paragraph. Accordingly, withdrawal of this ground for rejection is respectfully requested.

In addition, a Substitute Specification and Abstract, in clean and marked-up versions, are enclosed herewith. The Substitute Specification and Abstract are submitted in order to employ terms that are more commonly used by persons skilled in the art. No

new matter is being added in the Substitute Specification and Abstract. Accordingly, entry thereof are respectfully requested.

In the Office Action dated April 27, 2005, the Examiner rejected claims 1 and 3-5 under 35 U.S.C. 103(a) as being unpatentable over US 6,691,543 (Steffens et al.).

According to the Examiner, Steffens discloses a deep rolling apparatus having two arms (9) with a deep rolling head (13) and a supporting roller head (14). The supporting roller head has two supporting rolls (21, 22) and the deep rolling head has two rollers (23, 24).

A driving device (12) opens and closes the deep rolling apparatus. The Examiner also asserted that this reference discloses an axial guide roller (27) on the supporting roller head (14) which has an axis of rotation perpendicular to an axis of rotation of a crankshaft. The guide roller (27) has a diameter list and the distance between lubricators.

The guide roller is at an angle and has a spacing. The guide roller is cylindrical or crowned (39, 40) and they have two rollers. The Examiner acknowledged that Steffens does not disclose that the guide roller is located on the deep rolling head. However, the Examiner concluded that it would have been obvious to one skilled in the art at the time of the invention to provide the deep rolling apparatus of Steffens with an axial guide roller on either the deep rolling head or the supporting roller head in order to keep the rollers (21, 22, 23, 24) from knocking against the lubricators. The Examiner further stated that Steffens provides motivation to locate a support roller on the deep rolling head at col. 3. lines 50-52, wherein it is stated that an axial guide roll is able to guide a deep rolling head at the same time as a supporting head. According to the Examiner, the skilled artisan would therefore have been motivated to experiment with guide rolls on

deep rolling heads and supporting roller heads because of the quality of the pivoting movement of the heads about pivot (11).

Although the Examiner indicated that claim 2 contains allowable subject matter, applicants believe that claims 1 and 4-5 are also allowable for the reasons set forth below.

With all due respect to the Examiner, it is believed that he has engaged in a hindsight reconstruction of applicant's invention. Specifically, it is believed that the Examiner modified the teaching of US 6,691,543 in light of the teachings of the present application in order to arrive at the claimed invention.

The object of the present invention is to provide an axial guide roller on a deep rolling head of a scissors-type deep rolling apparatus, which enables to absorb force emanating from or being generated at the deep rolling apparatus in the axial direction (amended claim 1; amended description: Page 2). In this regard, the invention concerns the problem that support roller heads may develop forces in axial direction of the crankshaft and thus have a negative impact on working results (amended description: Page 1).

The state of the art disclosed in US 6,691,543 B2 (Steffens et al) – cited as US '543 hereinafter – corresponds to the German Utility model application DE 299 10 214.9 which is discussed on page 1 of the application.

US '543 discloses a scissors-type deep rolling apparatus providing an axial guide on its support roller head (US '543: Main Claim). Due to the scissors-construction of the apparatus, the work roller head 13 and the support roller head 14 of the known apparatus cannot move individually in the direction along the axis of the crankshaft (US '543, Col. 2, lines 40-43). The axial guide roll 27 provided on the support roller head 14 also guides

the work roller head 13 thereby avoiding collisions with the oil collars especially during closing the apparatus (US '543, Col. 3, lines 9-12, lines 50-52; Col. 1, line 51).

Accordingly, US '543 teaches that providing an axial guide on the support roller head solves the problem of collisions of both the support roller head and the work roller head.

In addition to that, persons skilled in the art would understand from US '543 that the known scissors-type deep rolling apparatus is designed in a way that during the closure of the apparatus at first the support rolls and after that the work rolls bear against the crankshaft (US '543, col. 1, lines 21-27; col. 2, lines 63-67).

Contrary to the Examiner's assertion, US '543 could not motivate a skilled person to provide a guide roll on the work roller head. This is because closing an apparatus of the type presented in US '543 while guiding the work roller head would have the effect that in a period of time during which the support rolls, being ahead of the work rolls at this state, would not be guided properly and would therefore possible collide with the crankshaft. Accordingly, taking into consideration the function of the apparatus known from US '543, the skilled artisan clearly would recognize that by providing a guide roll on work roller head, the favourable function of the known apparatus would be impaired. Moreover, the Examiner's statement that the skilled artisan "would have been motivated to experiment" is not the appropriate standard. As has been stated frequently, "obvious to try" is not the equivalent of obviousness.

Furthermore, US '543 discloses on the one hand to guide actively a support roller head relative to a crankshaft, and on the other hand, based on the fixed relation between the roller heads, to guide a work roller head relative to said support roller head.

Unfavorable lateral forces induced by the support roller head are not considered in US

'543 at all. However, the inventors of the present invention realized that these lateral forces have a negative impact on the relation between the work roller head and the crankshaft due to the fact that the work rollers are unable to bear forces in the direction of the crankshaft.

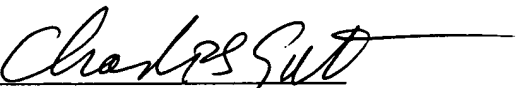
It has to be emphasized that the problem being solved by the invention is that the work rollers of the apparatus known from US '543 cannot bear any forces in the longitudinal direction of the crankshaft (amended description: page 1). Accordingly, the state of the art disclosed in US '543 constitutes the technical background of the invention. However, US '543 does not disclose any hint how to solve the problem which according to the conclusion of the inventors is involved in the known apparatus.

The other prior art references cited by the Examiner were cited only to show the background of the invention. Therefore, it is not necessary to discuss them in detail. It suffices to say that the claimed invention, as set forth in claim 1, is not rendered obvious by the combination of US '543 and the other prior arts cited by the Examiner.

In view of the foregoing, it is believed that the present application is in condition for allowance and a favorable action on the merits is respectfully requested.

Respectfully submitted,

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Attachment: Replacement Sheet for Fig. 8
Substitute Specification and Abstract in Clean
and Marked-up Version